Chapter 2

2 PROJECT DESCRIPTION AND ALTERNATIVE DEVELOPMENT

This chapter describes the project's objectives and discusses the process used to develop the Proposed Project as analyzed in this document. It also describes the design criteria, design concepts, and site locations associated with the Lower Steiner Flat and Upper Junction City sites. Two alternatives are considered in this document: the No-Project alternative and the Proposed Project alternative. Alternatives considered but not selected for evaluation are also presented. The term Proposed Project is used rather than Proposed Action, however, for the purposes of this document, the terms are synonymous.

2.1 Background

The Trinity River FEIS/EIR identified 44 potential channel rehabilitation sites and three potential side channel sites between Lewiston Dam and the North Fork Trinity River (USFWS et al. 2000a). These sites were originally prescribed for rehabilitation in the Trinity River Flow Evaluation Report (USFWS and HVT 1999) and included in the preferred alternative identified in the ROD. The ROD prescribed rehabilitation efforts at these sites to be implemented in phases. Early TRRP planning efforts resulted in the identification of two phases, Phase 1 and Phase 2. Subsequently, during ROD implementation by the TRRP, the originally identified sites were revisited and redefined. The Trinity River Master EIR (Tables 1-1, 1-2, and 1-3) describes the relationship between sites identified in the ROD and sites defined subsequent to the ROD. Ultimately, sites at which rehabilitation activities could be implemented were selected using criteria that identified physical features and processes such as channel morphology, sediment supply, and high-flow hydraulics that would encourage a dynamic alluvial channel. Factors such as property ownership, access to the sites, and engineering and economic feasibility were also considered in the site selection process.

The first of the post-ROD channel rehabilitation projects were implemented at sites downstream of Canyon Creek (e.g., Hocker Flat and the Canyon Creek suite), where natural high flows would maintain constructed alluvial features while ROD flows were contested in court. After the ROD was upheld in November 2004 by the United States Court of Appeals for the Ninth Circuit, channel rehabilitation designs focused on modifying alluvial features (e.g., berm removal), at locations where pronounced fossilized riparian berms had developed in response to changes in the flow regime and sediment flux that resulted from construction and operation of the TRD. Although berm removal and reforming alluvial features continue to be emphasized in channel rehabilitation efforts, the restoration of alluvial processes, coupled with the creation of high-value juvenile fish margin and side-channel habitat (low velocity, shallow, and in close proximity to cover; Alvarez et al. 2010), are now emphasized by the TRRP in order to increase habitat for anadromous fish. This approach is consistent with the recognition in the Trinity River FEIS/EIR that the rehabilitation sites exhibit a variety of conditions that require site-specific designs. The Trinity River FEIS/EIR also acknowledged that, in many instances, an entire site would not require treatment to facilitate rehabilitation. This is because strategically treating certain areas is expected to result in fluvial processes that will promote the formation and maintenance of complex fish habitat (e.g., alternating channel bars) in both treated and untreated sections of the river. To meet the project objectives the TRRP has identified 15 discrete activities (see Chapter 2 of the Trinity River Master EIR), most of which have been incorporated into the Proposed Project as described later in this chapter. In addition to these activities, several earthwork and habitat construction activities which were identified in the Master EIR have grown in scope in recent projects. The addition of wood (large woody debris – LWD) is elaborated on in this document as an important rehabilitation tool and construction of split flow channels is now added. In the Master EIR, LWD placement was included within sediment management activities and common activities at each site. However, in the Wheel Gulch EA/IS (North Coast Regional Water Quality Control Board and Reclamation 2010) LWD installation was identified as a standalone construction activity. The increasing use of wood to create aquatic habitat and hydraulic complexity (scour) at channel rehabilitation sites, and recommendations for additional wood use at future sites (Cardno Entrix and CH2MHill 2011), require that this important rehabilitation activity be highlighted as a common activity planned in the Proposed Project and other Phase 2 sites. Similarly, construction of a split flow channel, which divides Trinity River flow into two branches of similar volume, is proposed and identified as an individual activity in Table 1; a similar split flow channel was constructed at the Lowden Ranch project in 2010 and Wheel Gulch in 2011. The impacts associated with implementation of these activities do not rise above those identified and analyzed in the Master EIR, but their increasing use and visibility requires that these activities be clearly identified for the reader.

2.2 Goals and Objectives

The TRRP has developed a number of programmatic objectives for the channel rehabilitation sites that help frame the alternative development process. These programmatic objectives are intended to be used to identify specific activities that could be implemented at Trinity River locations. Ultimately, the goal of the activities described in the Trinity River Master EIR is to increase the quantity and quality of suitable rearing habitat for native anadromous salmonids and other native fish species, while reestablishing geomorphic processes required to enhance alluvial features (alternate point bars) in the Trinity River. These objectives were used by the project design team to identify specific activities that could be applied within the Proposed Project. This document focuses on these activities that are intended to restore fluvial processes through the rescaling of the river channel and floodplain for the purpose of creating, restoring, and enhancing habitats for all life stages of native anadromous fishes, including salmon and steelhead. Designs at Lower Steiner Flat and Upper Junction City have been specifically updated to ensure that salmonid adult holding is not negatively impacted.

With input from stakeholders, the lead agencies considered a number of objectives in the alternative development process (see Trinity River Master EIR, Section 2.2 for these objectives). For the Proposed Project, the specific in-channel (within the active low water channel) and riverine (within the ordinary high water mark [OHWM], but not contiguous with the active channel) activities proposed are intended to assist in reestablishing fluvial processes and interactions. Conceptually, the objective is to increase connectivity between the Project sites, the Trinity River, and their shared floodplain. The proposed rehabilitation activities could result in the development of a larger and more complex expanse of river and floodplain habitat. Based on successful TRRP rehabilitation projects constructed over the past six years, it is anticipated that fluvial processes will affect a larger area than the defined limits of activity within the Proposed Project site boundaries.

This habitat expansion is expected to increase habitat suitability and availability for salmonids and other native fish and wildlife species at various river flows.

2.3 Alternative Development

The President's Council on Environmental Quality (CEQ) guidelines (Section 1502.14) and CEQA guidelines (Section 15126.6(a)) state that an EIS or EIR shall describe a range of reasonable alternatives to the Proposed Project that would feasibly attain most of the basic objectives of each project, but would avoid or substantially lessen significant effects in comparison to the Proposed Project (Section 2.5 later in this chapter provides brief descriptions of alternatives considered but eliminated from further evaluation). Section 15126.6(c) of the CEQA guidelines states that among the factors which may be taken into account when addressing the feasibility of alternatives is site availability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site.

The alternative development process for the TRRP considered input from stakeholders, particularly local residents and resource agency personnel; existing engineering data; and social, physical, and biological factors. Consistent with the AEAM Program, the Proposed Project designs reflect the collective experience of the TRRP and the TMC from the implementation of previous mechanical channel rehabilitation projects (Indian Creek, Sawmill, and Wheel Gulch among others). Information derived from the implementation of these projects, coupled with information on the biological and physical responses to these projects, was considered in the alternative development process.

The following criteria were applied to evaluate the ability of the Proposed Project to meet the objectives outlined in section 2.2 of this document. Pursuant to NEPA, the purpose and need (presented in Chapter 1) were also considered in this evaluation.

- Effectiveness – The methods, materials, and performance of previous Trinity River restoration projects (including the original pilot projects constructed in the 1990s and the recent TRRP channel rehabilitation projects) in similar environments.
- Implementation – Practical execution, including potential public acceptance issues, permitting issues, and land use issues, was considered. Constructability and the complexity of maintaining the rehabilitation sites over time were also considered.
- Environmental – Benefits and impacts to environmental resources with emphasis on special-status species, including native anadromous salmonids, and humans were considered. The impacts considered included both short-term construction-related impacts and long-term maintenance impacts associated with post-ROD flows. Aquatic habitat, jurisdictional wetlands, accessibility, and consistency with land use planning were considered in the type and location of proposed activities.
- Cost – The relative cost of each alternative, including construction and revegetation costs, was considered. Cost was used to identify alternatives that were significantly out of proportion with other alternatives.

A number of alternatives were initially evaluated in the Trinity River Master EIR using the criteria outlined above; as a result three alternatives were included in that analysis –No-Proposed Projects alternative, Proposed Projects alternative, and Alternative 1. The Proposed Projects alternative was determined to most efficiently meet project objectives and was selected as the preferred alternative in the Trinity River Master EIR. Alternative 1 was analyzed in the Trinity River Master EIR in response to input provided by stakeholders, including landowners along the river corridor, and represented a reduction in the size, intensity, and magnitude of rehabilitation activities, particularly those in close proximity to residential or recreational developments. Alternative 1 was expected to reduce significant impacts to various resources, especially to the human environment (e.g., traffic, noise near residential areas, etc.); however, it was not expected to expand Trinity River aquatic habitat complexity and quantity or to enhance natural river processes to the same extent as the Proposed Project alternative. Consequently, benefits to fish and wildlife populations would be reduced compared to the Proposed Projects. As a result Alternative 1 was not selected as the preferred alternative in the Trinity River Master EIR and is not carried forward for analysis in this EA/IS.

2.4 Description of Alternatives

A description of the two alternatives that are carried forward in this analysis is presented in the following sections. This section describes the Proposed Project and the No-Project alternative, which is required by NEPA. The No-Project alternative is presented first to provide comparison of impacts to the Proposed Project.

2.4.1 No-Project Alternative

The No-Project alternative represents ongoing activities and operations of the TRRP and other entities involved in restoring the Trinity River with the exception of the Proposed Project. Consistent with CEQA Guidelines, Section 15126.6, subdivision (e)(2), existing conditions are defined as those that "would be reasonably expected to occur in the foreseeable future if the project were not approved" (Association of Environmental Professionals 2009). This is consistent with the NEPA definition of the No Action alternative involving federal decisions (42 USC 4321–4347). Collectively, actions and activities authorized in the ROD and incorporated into the No-Project alternative include:

- Implementation of the annual flow release schedule based on recommendations of the TMC to the Bureau of Reclamation; and
- Implementation of watershed restoration and rehabilitation projects within the Trinity River Basin, including those funded by the TRRP and members of the TMC, BLM, and TCRCD.

2.4.2 Proposed Project

The Proposed Project includes specific activities within the Lower Steiner Flat and Upper Junction City site boundaries as well as use of an upland spoil area in the Lower Junction City site boundary that is adjacent to the Upper Junction City site. The activities proposed are similar to those implemented at previous channel rehabilitation sites and include reducing riparian encroachment, LWD placement, physical alteration of alluvial features (e.g., floodplains and side channels), construction of hydraulic structures (wood and log features), and removal/replacement of riparian vegetation at strategic locations. The Proposed Project also includes placement of skeletal bars (rock between 6"and 12" diameter) at Lower Steiner Flat, and skeletal bar / island complexes (rock 6"-24" in diameter for structural integrity and fines < ½" for vegetation growth) at Upper Junction City. The specific activities that would occur within the Proposed Project site boundaries are described below and shown on Figures 4 and 5 for Lower Steiner Flat and Figure 6 for Upper Junction City. The activities at the Lower Steiner Flat Rehabilitation Site are proposed to occur in two phases; Phase A activities are planned for 2012 and Phase B activities are future proposed activities that would likely occur within the next five years. The information contained in this section describes the timing, kind, size, intensity, and location of the activities associated with the sites consistent with the CEQA Guidelines (Section 15176 (a) and (c)).

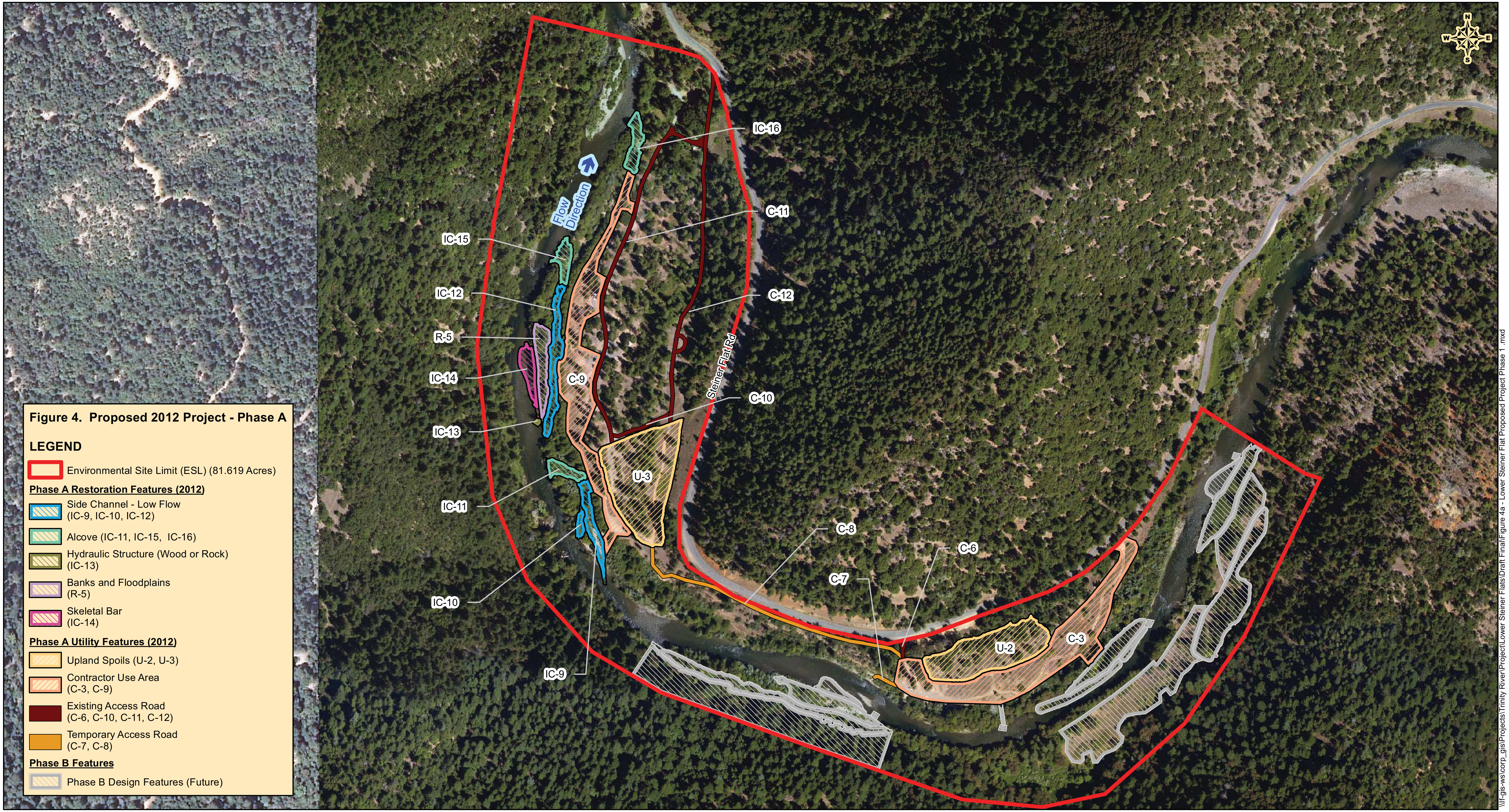
2.4.2.1 Mechanical Channel Rehabilitation Activities

The TRRP has developed site-specific objectives for the sites as well as specific activities that would occur at defined locations in support of these. For the Lower Steiner Flat Rehabilitation Site these objectives are:

- Maximize rearing habitat for the target species (chinook and coho salmon and steelhead trout) by increasing the quantity, quality, and accessibility of refuge habitat during high flows, forage habitat during summer, and edge habitat and cover year-round (e.g., low velocity LWD habitat structures and pools). Prioritize habitat for juvenile and fry salmonids during low flow periods, when quantity and quality of their habitat is most limited.
- Maximize spawning habitat for the target species by increasing the quantity, quality, and accessibility of spawning habitat during late summer (deep pools in close proximity to riffles with clean gravels) and clean gravels during the winter (for egg survival).
- Reduce flow depths, velocities, and shear stresses in the main channel for peak flows in order to increase potential for deposition of spawning gravels in appropriate locations.
- Create elements that are likely to initially persist for up to a decade, and then evolve as geomorphic processes reshape the post-construction river.
- Maximize protection of high quality existing riparian vegetation (excludes blackberry and alder).
- Maximize potential for recruitment of herbaceous and woody riparian species.
- Minimize disturbance of resources considered historically or aesthetically significant.
- Decrease time of closure for onsite recreational pursuits (e.g., camping, fishing, and boating).

For the Upper Junction City Rehabilitation Site the overall goal of the proposed design is to increase fry rearing habitat availability at all flow levels while maintaining existing adult holding habitat. Achievement of this goal would be through implementation of the following design objectives:

- Increase hydraulic variability and edge length of the low and moderate flow channel (300 to 2,000 cfs) by creating a flow split and island complex in the upstream portion of the site.
- Increase channel edge length and complex fry rearing habitat availability by creating baseflow side channels and increasing relief of wetted surfaces at moderate flows (up to 2,000 cfs).
- Increase functional floodplain area with selective terrace lowering.
- Increase shoreline complexity over a range of flows by creating topographic variability and establishing riparian vegetation along the floodplain margins.
- Protect adult holding habitat by designing for flow convergence into existing pools and limiting overbank conveyance.
- Increase biological production by developing off-channel rearing ponds.



California State Plane Zone 1, NAD83 Feet

Imagery collected by Watershed Sciences Inc., on 8-25-2011

Prepared for the Bureau of Reclamation
Trinity River Restoration Program

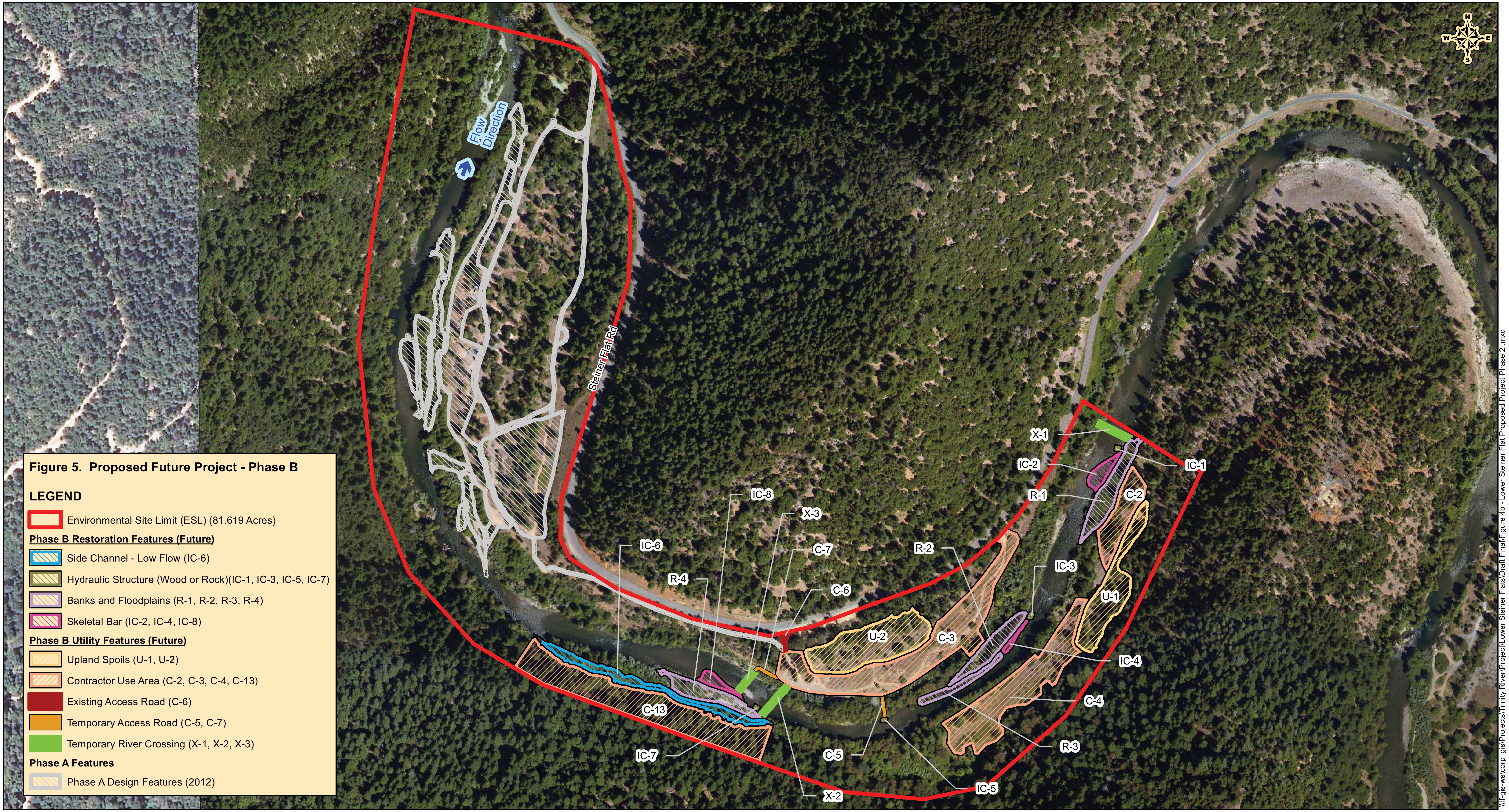
TRINITY RIVER RESTORATION PROGRAM - LOWER STEINER FLAT PHASE A (2012) AND PHASE B (FUTURE) PROJECTS
PROPOSED CHANNEL REHABILITATION SITE ENVIRONMENTAL ASSESSMENT/INITIAL STUDY

DATE: 2-2-2012

0 500 1,000 1,500 2,000 Feet

SCALE: 1:4,200

North Wind
A CIRI COMPANY
North Wind Services
1425 HIGHAM ST.
IDAHO FALLS, ID 83402
WEB: www.northwindgrp.com
Phone: (208) 528-8718 FAX: (208) 528-8714



California State Plane Zone 1, NAD83 Feet

Imagery collected by Watershed Sciences Inc., on 8-25-2011

Prepared for the Bureau of Reclamation
Trinity River Restoration Program

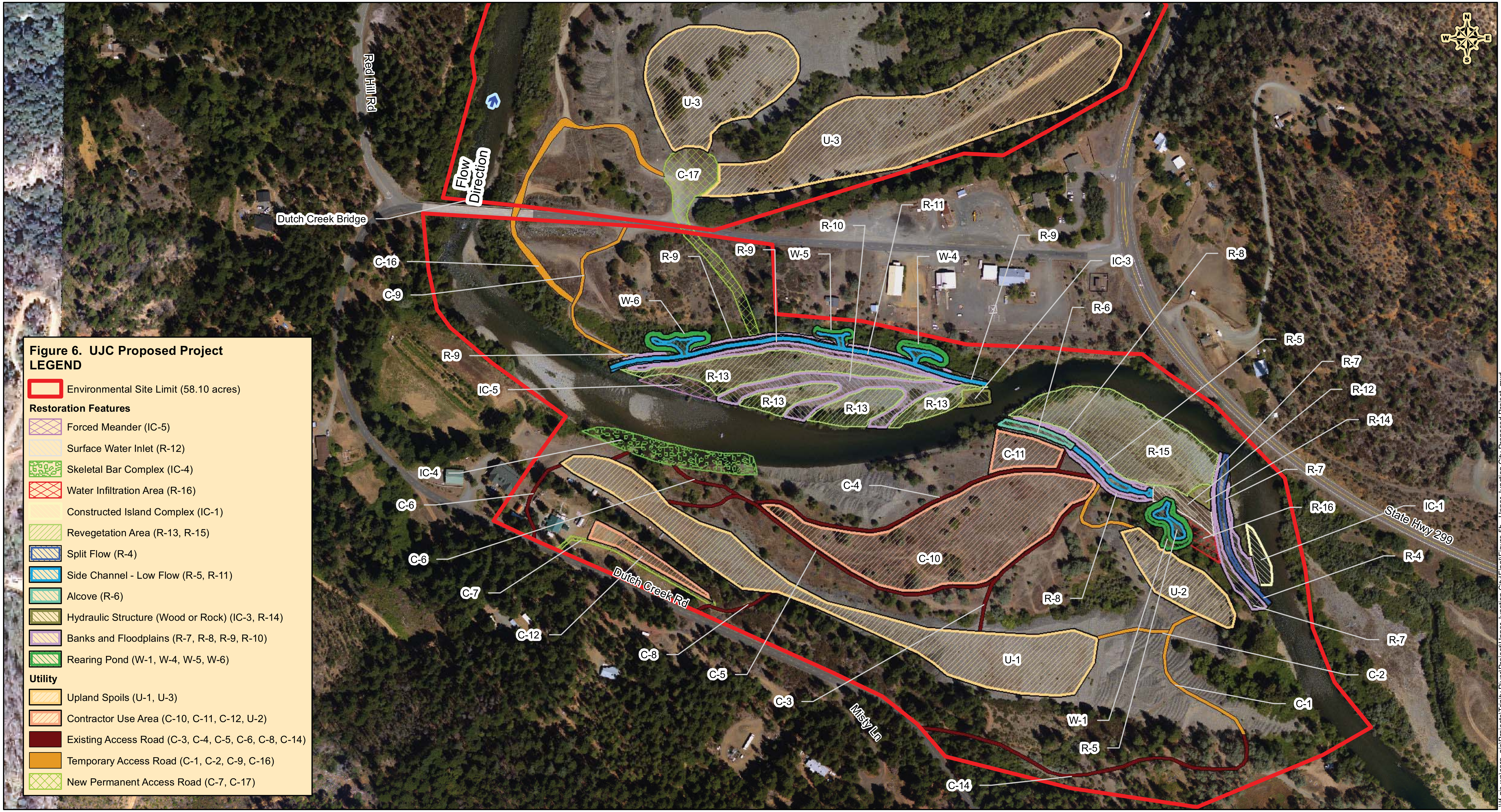
TRINITY RIVER RESTORATION PROGRAM - LOWER STEINER FLAT - PHASE A (2012) AND PHASE B (FUTURE) PROJECTS
PROPOSED CHANNEL REHABILITATION SITE ENVIRONMENTAL ASSESSMENT/INITIAL STUDY

DATE: 2-3-2012

0 500 1,000 1,500 2,000 Feet

SCALE: 1:4,200

North Wind
A CIRI COMPANY
North Wind Services
1425 HIGHAM ST.
IDAHO FALLS, ID 83402
WEB: www.northwindgrp.com
Phone: (208) 528-8718 FAX: (208) 528-8714



California State Plane Zone 1, NAD83 Feet

Imagery collected by Watershed Sciences Inc., on 8-25-2011

Prepared for the Bureau of Reclamation
Trinity River Restoration Program

TRINITY RIVER RESTORATION PROGRAM - UPPER JUNCTION CITY
2012 PROPOSED CHANNEL REHABILITATION SITE ENVIRONMENTAL ASSESSMENT/INITIAL STUDY

DATE: 2-1-2012

0 300 600 900 1,200 Feet

SCALE: 1:3,100

North Wind
A CIRI COMPANY
North Wind Services
1425 HIGHAM ST.
IDAHO FALLS, ID 83402
WEB: www.northwindgrp.com
Phone: (208) 528-8718 FAX: (208) 528-8714

Below are general descriptions of the types of activities included within the Proposed Project (Table 1). Refer to Section 2.3.2 of the Trinity River Master EIR for more information about each of these activity types.

Table 1. Rehabilitation Activities at the Proposed Project Sites[5]	
LABEL	**ACTIVITY TYPE**
A	Recontouring and vegetation removal (banks and floodplains)
B	Construction of inundated surfaces (450 cfs)
C	Construction of inundated surfaces (1,000 – 4,500 cfs)
D	Construction of inundated surfaces (6,000 cfs)
E	Low-flow side channel (300 cfs)
F	High-flow side channel and gravel infiltration areas
G	Alcove
J	Placement of excavated materials
K	Staging/contractor use areas (includes gravel/rock processing and stockpiling)
L	Roads, existing
M	Roads, new
N	Temporary channel crossings
O	Revegetation
P	Large woody debris installation, construction of engineered log jams/hydraulic structures (wood and/or rock) or skeletal bar placement
Q	Split flow channel (30 to 60% of river flow)
W	Wetland complex – rearing pond

Activities A through G are intended to increase the potential for the river to meander (migrate) within the floodplain in which it has been confined by historic dredging activities and, more recent, impacts related to the construction and operation of the TRD. In addition to the immediate changes to the channel (e.g., side channel construction and berm removal), the Proposed Project would increase the likelihood that the Trinity River would reflect more of the "healthy river" attributes of an alluvial river, as described in Section 4.3 of the Trinity River Master EIR. Activities E, F, G, P, and Q are intended to create off-channel habitat that would provide refuge for salmonids and other aquatic wildlife during inundation. The side channels, alcoves, and floodplain enhancements would also provide additional complexity to the riverine environment and areas of riparian habitat diversity. All of these activities are consistent with the "healthy river" attributes. Activities J through M are associated with the transfer, placement, and stabilization of material excavated from the riverine areas. In conjunction with Activity J, various grading techniques would be used to develop seasonal, off-channel riparian habitat available for western pond turtles and other riparian-dependent species. Activity K includes the processing and storage of coarse sediment or boulder material for use in construction of hydraulic structures (Activity P). Activity P is intended to increase woody material which is a natural part of healthy rivers and provides important habitat for aquatic species, including cover from high flows and predators, collection of suitable spawning materials, and a food source for aquatic insects. It can also create and maintain beneficial habitat features such as pools, side channels, islands, and gravel bars. Activity O includes revegetation of disturbed surfaces. Activity Q would create a split flow channel off the mainstem Trinity River that

[5] Several activity labels are omitted (e.g., H for grade control removal) as these activity types were enumerated in the Master EIR but not utilized at the Proposed Project sites.

would flow at all times including during low flow conditions. Activity W would create wetland complexes that may be used as rearing ponds for juvenile salmonid species.

Activity A (Recontouring and Vegetation Removal)

The ground surface would be modified to reduce riparian encroachment and minimize the risk of stranding of juvenile salmonids. Vegetation would be cleared at some locations, but would be maintained where possible. Activity A, sometimes referred to banks and floodplains, also includes grading to construct or enhance topographic features that could develop into functional riparian habitat; excavation and fill would be balanced such that there is no net change in the volume of earthen material within the activity area. In Phase B at the Lower Steiner Flat site, vegetation thinning would occur within densely vegetated and low angle areas on the river's left bank. Vegetation removal would enhance historic mature forest wildlife habitat. Removed vegetation would be used for in-river placement as LWD, chipped/masticated, or spread/buried in revegetation areas in order to increase nutrients and water holding capability of the soils. Activities would be accomplished using a variety of methods, including hand tools and heavy equipment, such as excavators, bulldozers, scrapers, and dump trucks.

Activities B, C, and D (Construction of Inundated Surfaces)

Activities associated with the construction of inundated surfaces would enhance the connection of these surfaces to the river at various flows. As a reference point, the OHWM correlates to a 1.5-year recurrence flow. (On figures the OHWM is estimated by hydraulic modeling). These activities are intended to expand the surface area of the channel that could be inundated by reoccurring flows below the OHWM. Vegetation would be cleared as necessary, and earth would be excavated to meet design elevations for periodic inundation. One unique element in the design at the Upper Junction City Rehabilitation Site is construction of an infiltration gallery at R-12. The infiltration gallery is designed to enhance connection of the R-5 side channel with the mainstem without removing surface flow and reducing main channel "stream power" from the main channel.

Newly inundated surfaces would provide important rearing and slow-water habitat for juvenile salmonids and other native anadromous fish. They would also provide low points that could enhance sinuosity and thereby provide the habitat variability that was historically present and is required to support rapid growth of native fishes.

These treatment areas would rely on a combination of natural recruitment of native riparian vegetation and riparian planting to enhance the establishment of a diverse assemblage of native vegetation. If initial revegetation establishment is less successful than anticipated, additional efforts would be made to establish riparian vegetation consistent with the CDFG policy of no net loss in riparian vegetation from pre-project levels.

Activity E and F (Side Channels)

Modifications to historic side channels would reconnect the Trinity River with its floodplain at targeted flows. Side channels constructed for 300 cfs flows would provide off-channel, low-velocity habitat for a variety of aquatic organisms, including juvenile salmonids at base flow conditions. Side channels constructed for 1,000 cfs flows would provide habitat for salmonid rearing when water is flowing through the channels. As flows recede during the year, these side channels would drain naturally, reducing the likelihood of stranding aquatic organisms. It is important to note that side channels do not necessarily flow year round. Side channels would evolve over time and partially vegetate. While the duration of side channel flow would be dependent upon their evolution over time and the river's water surface elevation, even when water is not flowing, riparian and wildlife habitat diversity would be increased.

Side channels would be constructed to leave earthen berms near the upstream and downstream ends to protect water quality during construction. These berms would be removed at the end of construction if the water in the side channel is of appropriate quality for discharge to the river or the water in the side channel would be left in place for removal by subsequent high flows. Side channels may be pumped to uplands and dewatered during construction, or slowly metered into the mainstem post-construction. These techniques reduce the amount of turbid water which ultimately reaches the Trinity River during side channel connection.

Activity G (Alcoves)

Alcoves would be excavated to design elevations at the downstream end of side channels or other appropriate locations. They would be continuously inundated (approximately 1-2 feet deep during low flows), scoured/maintained during high flows, and would provide year-round juvenile fish habitat.

Activity J (Placement of Excavated Materials)

Excavated materials would be placed in spoil areas so that there would be no increase in the elevation of the 100-year flood to comply with the requirements of Trinity County's Floodplain Ordinance. Spoiled materials would be spread in uniform layers that blend with the natural terrain. In general, revegetation of upland areas, including efforts required for erosion control, would be consistent with agency requirements and with authorization from land managers and owners. Refer to Activity O (Revegetation) for more information. Placement of excavated and cleaned coarse sediment or cobbles may alternatively be used to create an infiltration gallery (as at R-12 in the Upper Junction City design) to allow sub-surface water flow.

Activity K (Staging/Contractor Use Areas)

Excavated materials would be transported across the staging area to stockpile areas. Water would be applied for construction purposes, including dust abatement, as directed by the Contracting Officer. Activity in these areas would include maintaining existing water wells and other infrastructure. The staging area may also be used for processing and storage of coarse sediment required for long-term sediment management activities or to obtain and store boulders for use in constructing hydraulic structures. In forested areas (e.g., C-13 at the Lower Steiner Flat site) forest thinning may occur, under BLM guidance, in order to enhance historic mature forest habitat conditions. Thinned forest material would be used in wood installations.

Activity L and M (Roads, Existing and New)

Access to the Proposed Project sites would be via Dutch Creek Road and Steiner Flat Road. These roads would be used for one or more activities (e.g., access for equipment and personnel, removal of material, revegetation efforts, and monitoring activities). The location of the activity areas within the sites would require construction of new access roads for specific project purposes. Site-specific design would consider factors like topography, soils, existing vegetation, and the need for future vehicle access. Best management practices (BMPs) would be used to reduce the impacts of road-related sediment on the riparian and aquatic environments.

Activity N (Temporary Channel Crossings)

Temporary crossings would provide access across the river. These temporary crossings occur in "X" activity areas on the figures, and may include constructed fords, temporary bridges, or other site improvements to facilitate access for construction-related traffic. If required, temporary bridges would be used when crossings will be made outside of the summer (July 15-September 15) in-channel work window. All temporary crossings would be designed and constructed to meet the requirements for heavy equipment such as trucks, excavators, and scrapers. Fords would be constructed using native alluvial materials excavated from the bed and bank of the Trinity River or adjacent sources. With the exception of rip-rap or other stabilizing materials, material would be primarily extracted from activity areas within identified TRRP sites.

Due to requirements to retain passage for fish and boats, at least 1/3 of a ford crossing would be submerged to a minimum depth of 1 foot under low-flow conditions. The construction of the temporary crossings would likely require some vegetation removal at entrances and exits to the channel. If temporary bridges or other constructed crossings are used, abutment material may be extracted from activity areas. All temporary crossings would be constructed in a manner that does not impede navigability at the specific site.

Activity O (Revegetation)

Impacts to vegetation are anticipated at most of the activity areas. Revegetation of riparian areas would rely on a combination of planting and natural recruitment of native species. Revegetation would occur to address landowner requests and fish and wildlife requirements. Native willows from the impact areas would be replanted as clumps during construction to speed recovery of vegetation. Replanting of impacted native vegetation (e.g., willows and cottonwoods) after construction is also planned. In general, the TRRP objective is to ensure that riparian vegetation is minimally impacted by TRRP activities and is replaced at a 1:1 ratio (no net loss of riparian area habitat) within the Trinity River corridor. Revegetation is designed to provide aquatic refugia at high flows, improve terrestrial habitat for birds and other wildlife, provide future wood recruitment, and to provide future terrestrial nutrient input to the river. Additional planting, seeding and mulching is also planned to control or inhibit the reestablishment of noxious and invasive plant species.

Activity P (Large Woody Debris, Hydraulic Structure, Skeletal Bar Installation)

The TRRP would use appropriate materials to cause and enhance geomorphic action which would also enhance aquatic and wildlife habitat. Addition of large rock (> 6 inch as in the ROD's skeletal bars) or rock/wood structures would remain in place and confine the river, thereby increasing stream power to scour and maintain adult salmonid holding habitat. Skeletal bars which incorporate LWD (skeletal bar complexes) are proposed for the Upper Junction City site while skeletal bars of immobile river rock are proposed at the Lower Steiner Flat site.

As appropriate, salvaged LWD would be retained and incorporated into riverine/in-channel activities to provide additional hydraulic and habitat complexity. This could include LWD placement as individual pieces, small accumulations, and large habitat structures. The addition of large wood would develop topographical and hydraulic complexity and increase bank length to provide additional rearing habitat over a wide range of flows. Incorporation of woody material would improve anadromous fish spawning and rearing habitat.

Woody material is a natural part of healthy rivers. It provides important habitat for aquatic species by providing cover from high flows and predators. Its low velocity areas collect suitable spawning materials and its organic materials are a food source for aquatic insects. It can help create and maintain beneficial habitat features such as pools, islands, and gravel bars. Activity P may also include the construction of engineered log jams (ELJ) to further engage the flow and act as a catalyst for natural processes of channel migration. Construction of larger habitat structures or ELJs may incorporate the use of rock and boulders as ballast to ensure that the structures do not migrate with high flows. Furthermore, these ELJs may specifically be built with downstream "skeletal bars," thus forming habitat complexes which would grow in depositional areas.

All LWD installations would be designed so that local velocities would be safe for navigation during relatively low river flows (less that approximately 2,000 cfs). Natural wood material would be placed in a manner to reduce the chances of hazardous contact with swimmers and boaters. In the longer-term, woody material would create areas of slower flow around the wood and force water flow and, consequently, boaters away from the LWD. This would minimize the hazard of these structures to people.

The Proposed Project would place wood in alcoves to improve the quality of habitat in this design element by providing cover for juvenile fish, enhancing roughness and complexity, and increasing shading. Because of uncertainties in the availability, types, shapes, and sizes of the wood and the planned construction methods, the exact amounts and locations of wood placement are not known at this time. The final locations and dimensions of wood and large rock (skeletal bar) placement would be determined in the field based on direction from Reclamation's field engineer.

Activity Q (Construction of Split Flow Channels)

A new channel would be excavated to accept between 30 and 60 percent of the mainstem Trinity River flow during low flow conditions. The constructed split flow channel would be excavated through the existing floodplain, generally behind the existing riparian berm and vegetation. Similar construction methods to those noted for low flow side channels (E) would be employed.

Activity W (Wetland Complexes – Rearing Ponds)

Ponds would be created off the mainstem Trinity River. The ponds would provide slow backwater refugia and year round rearing habitat for juvenile salmonid species. Groundwater infiltration and surface water in-flow from side channels would supply the ponds with a cold water environment. Existing tree/shrub canopy would be saved during construction to provide food sources, shade, and protection from predation. The ponds would contain deeper pools that have a connection to groundwater to supply needed cold water. Existing vegetative cover and re-vegetation planting would be incorporated into the ponds for food productivity.

2.4.2.2 Activity Areas

Tables 2 and 3 list the activity areas associated with the Proposed Project and Figures 4, 5, and 6 illustrate these activities and construction areas. As the tables show, each activity area has been assigned a unique alphabetic label that corresponds to the type of activity area. For example, U-1 is the identifier for upland activity area 1 at the site. These labels are used throughout this document. For the Proposed Project, discrete activity areas were defined by the interdisciplinary design team to include riverine areas, upland areas, and construction support areas. While these areas are intended to encompass the full range of activities, typically the actual area that will be treated would be smaller. For each site, riverine areas are labeled with an R preceding the site number (e.g., R-1, R-2); upland areas are labeled with a U (e.g., U-1, U-2); in-channel work areas are labeled with an IC; construction staging/contractor use areas are labeled with a C; and temporary crossings are labeled with an X. Roads are identified as existing or new. The tables also show the size of the activity areas, the estimated volume of material that would be excavated or filled in each activity area, and the primary use anticipated for each area. In some instances the numbering of activity areas at the sites is not consecutive because of the removal of activities that were originally proposed but were subsequently removed from the Proposed Project. See Section 2.5.3 under *Alternatives Considered but Eliminated from Further Evaluation*, for a discussion of changes that were made.

The activities included in Table 2 for the Lower Steiner Flat site include both Phase A (2012) and Phase B (Proposed Future) activities. Phase A activities are listed first and Phase B activities are listed second in the table.

Table 2. Activity Areas at the Lower Steiner Flat Rehabilitation Site

Activity Area[a]	Primary Activity	Activity/Treatment Area (acres)[b]	Excavation (cut) (cubic yards)[c]	Fill (cubic yards)[c]
Phase A – 2012 Activities				
C-3	Contractor use and boulder harvesting area (K)	2.918	0	0
C-6	Existing access road (L)	0.034	0	0
C-7	Temporary access road (M)	0.033	0	0
C-8	Temporary access road optional (M)	0.380	0	0
C-9	Contractor use area (K)	2.561	0	0
C-10	Existing access road (L)	0.081	0	0
C-11	Existing access road (L)	0.508	0	0
C-12	Existing access road (L)	0.510	0	0
	C Subtotal Phase A	**7.025**	**0**	**0**
IC-9	Anabranch/Low flow side channel (A,B,E)	0.349	1,880	0
IC-10	Anabranch/Low flow side channel (A,B,E)	0.082	975	0
IC-11	Alcove (G)	0.194	1,390	0
IC-12	Anabranch/Low flow side channel (A,B,E)	0.541	3,140	0
IC-13	Hydraulic structure (B,C,D,J)	0.018	0	0
IC-14	Skeletal bar (P,B,C,D)	0.278	0	900
IC-15	Alcove (G)	0.223	1,000	0
IC-16	Alcove (G)	0.283	1,545	0
	IC Subtotal Phase A	**1.968**	**9,930**	**900**
R-5	Berm and vegetation removal (A)	0.417	4,620	0
	R Subtotal Phase A	**0.417**	**4,620**	**0**
U-2	Upland spoil area (A,J,O)	1.598	0	0
U-3	Upland spoil area (A,J,O)	2.311	0	13,650
	U Subtotal Phase A	**3.909**	**0**	**13,650**

Table 2. Activity Areas at the Lower Steiner Flat Rehabilitation Site

Activity Area[a]	Primary Activity	Activity/Treatment Area (acres)[b]	Excavation (cut) (cubic yards)[c]	Fill (cubic yards)[c]
Phase B – Proposed Future Activities				
C-2	Contractor use area (K)	0.748	0	0
C-3	Contractor use and boulder harvesting area (A,K)	2.918	Grading	0
C-4	Contractor use area (K)	2.164	0	0
C-5	Temporary access road (M)	0.028	Grading	0
C-6	Existing access road (L)	0.033	0	0
C-7	Temporary access road (M)	0.034	Grading	0
C-13	Contractor use area (A, K)	2.757	0	0
	C Subtotal Phase B	**8.682**	**0**	**0**
IC-1	Hydraulic structure (P,B,C,D,J)	0.015	0	0
IC-2	Skeletal bar (P,B,C,D)	0.209	0	970
IC-3	Hydraulic structure (P,B,C,D,J)	0.018	0	0
IC-4	Skeletal bar (P,B,C,D)	0.085	0	900
IC-5	Hydraulic structure (P,B,C,D,J)	0.013	0	0
IC-6	Side channel low flow (A,C,D,O)	0.791	5,560	0
IC-7	Hydraulic structure (P,B,C,D,J)	0.013	0	0
IC-8	Skeletal bar (P,B,C,D)	0.165	0	520
	IC Subtotal Phase B	**1.309**	**5,560**	**2,390**
R-1	Banks and floodplains (A)	0.637	5,870	0
R-2	Berm and vegetation removal (A)	0.477	3,185	0
R-3	Overhanging alder cover (A,O)	0.292	0	0
R-4	Banks and floodplains (A)	0.521	2,500	0
	R Subtotal Phase B	**1.927**	**11,555**	**0**
U-1	Upland spoil area (A,J,O)	1.182	0	4,900
U-2	Upland spoil area (A,J,O)	1.598	0	10,370
	U Subtotal Phase B	**2.78**	**0**	**15,270**
X-1	Temporary river crossing (N)	0.096	0	0
X-2	Temporary river crossing (N)	0.104	0	0
X-3	Temporary river crossing (N)	0.071	0	0
	X Subtotal Phase B	**0.271**	**0**	**0**

[a] C = construction staging/contractor use areas
IC = in-channel work area
R = riverine work area
U = upland activity area
X = river crossing
[b] Area calculated from project GIS
[c] Provided by TRRP

Table 3. Activity Areas at the Upper Junction City Rehabilitation Site				
Activity Area[a]	Type of Activity	Activity/Treatment Area (acres)[b]	Excavation (cut) (cubic yards)[c]	Fill (cubic yards)[c]
C-1	Temporary access road (M)	0.178	0	0
C-2	Temporary access road (M)	0.047	0	0
C-3	Existing access road (L)	0.114	0	0
C-4	Existing access road (L)	0.243	0	0
C-5	Existing access road (L)	0.234	0	0
C-6	Existing access road (L)	0.117	0	0
C-7	New permanent access road (M)	0.116	0	0
C-8	Existing access road (L)	0.052	0	0
C-9	Temporary access road (M)	0.123	0	0
C-10	Contractor use area (K)	3.554	0	0
C-11	Contractor use area (K)	0.419	0	0
C-12	Contractor use area (K)	0.338	0	0
C-14	Existing access road (L)	0.240	0	0
C-17	New permanent access road (M)	0.717	0	0
	C Subtotal	**6.492**	**0**	**0**
IC-1	Constructed island complex (A,P,Q)	0.136	0	2,325
IC-3	Large wood hydraulic structure (P,B,C,D,J)	0.098	0	1,107
IC-4	Skeletal bar complex (P,B,C,D,J)	0.583	0	5,000
IC-5	Forced meander (B,C,D)	0.824	0	0
	IC Subtotal	**1.641**	**0**	**8,432**
R-4	Split flow channel complex (A,B,C,O,P)	0.233	5,491	0
R-5	Low flow side channel complex (A,C,D,O)	0.219	8,022	0
R-6	Alcove (part of R-5 complex) (G)	0.136	0	0
R-7	Floodplain bench and bank recontouring	0.439	0	0
R-8	Floodplain bench and bank recontouring	0.372	0	0
R-9	Bank recontouring	0.689	0	0
R-10	Floodplain recontouring and planting/enhancement	0.899	3,846	0
R-11	Low flow side channel complex (A,C,D,O)	1.150	10,548	0
R-12	Surface water inlet (J)	0.196	0	0
R-13	Revegetation area (O)	2.095	0	0
R-14	Large wood hydraulic structure (P,B,C,D,J)	0.070	0	370
R-15	Revegetation area (O)	1.975	0	0
R-16	Water infiltration area (B,C,D,J)	0.127	0	0
	R Subtotal	**8.6**	**27,907**	**370**
U-1	Upland spoil area (K,A,J,O)	3.751	0	22,241
U-2	Contractor use and rock processing area (K,A,J,O)	0.907	0	0
U-3	Upland spoil area (K,A,J,O)	7.431[d]	0	19,425[d]
	U Subtotal	**4.658**	**0**	**22,241**
W-1	Rearing ponds (A,B,O,W)	0.191	5,935	0
W-4	Rearing ponds (A,B,O,W)	0.113	3,403	0

Table 3. Activity Areas at the Upper Junction City Rehabilitation Site				
Activity Area[a]	Type of Activity	Activity/Treatment Area (acres)[b]	Excavation (cut) (cubic yards)[c]	Fill (cubic yards)[c]
W-5	Rearing ponds (A,B,O,W)	0.063	1,744	0
W-6	Rearing ponds (A,B,O,W)	0.131	4,510	0
	W Subtotal	**0.498**	**15,592**	**0**

[a] C = construction staging/contractor use areas
IC = in-channel work area
R = riverine work area
U = upland activity area
W = wetland design element
[b] Area calculated from project GIS
[c] Provided by TRRP
[d] Acreage not included in calculations as this area is in the Lower Junction City site boundary

ACTIVITY AREA DETAILS

Lower Steiner Flat Rehabilitation Site:

As stated previously, work at the Lower Steiner Flat Rehabilitation Site is proposed to occur in two phases: Phase A in 2012 and Phase B within 5 years (Future Proposed). Similar to the way the activities are presented in Table 2, Phase A activities are presented first in this section followed by Phase B activities.

Phase A

Low Flow Side Channels and Anabranches (IC-9, IC-10, and IC-12)
Low-flow side channels, separated from the main channel by either unvegetated medial bars or vegetated islands, would be created at this site. The term "low flow side channel" refers to any secondary channel occupied by water at low flow. This differs from an "anabranch" which, in this EA/IS, refers to a low flow side channel that is separated from the main channel by a vegetated, stable island (as opposed to an unvegetated medial bar), and which maintains a separate channel even during high flow. All three anabranch elements (IC-9, IC-10, and IC-12) take advantage of a previously constructed side channel on the right bank. The existing channel here is long, straight, and narrow compared with other sustainable low flow side channels in the Trinity River, and it is currently only occupied at high flow. The design would take advantage of the existing topography and would enhance the habitat value by directing a larger proportion of the flow into it, and providing more lateral connections. These actions would increase the quality, quantity, and frequency of the available rearing habitat. The design includes three low flow side channels.

High Flow Side Channels
The Proposed Project would retain some existing high flow side channel habitat on the right bank that currently provides low velocity refugia during high flows and helps to maintain alcoves at their downstream ends. Two portions of this existing high flow side channel would be preserved, that which connects alcove IC-11 with the IC-12 anabranch and that which runs between the IC-15 and IC-16 alcoves.

Alcoves (IC-11, IC-15, and IC-16)
The Proposed Project includes three alcoves (IC-11, IC-15, and IC-16), which would provide high quality rearing habitat at the exits of side channels and high flow side channels. The first two

proposed alcoves are at the downstream ends of anabranches, and the third (IC-16) is at the downstream end of the existing high flow side channel. Large wood would be placed strategically in the alcoves to provide cover and shade. High flow side channels, that are in association with these alcoves, would be expected to route water and scour the alcoves during high flow periods.

Berm and Vegetation Removal (R-5) *(Banks and Floodplains in Figure 4)*
Riparian "berms"—sand-dominated features that have been colonized by dense vegetation such as alder, willow, and blackberry—have formed along portions of the Lower Steiner Flat reach, in part because of flow regulation. To allow for more dynamic alluvial features, the Trinity River Flow Evaluation Report and the ROD both recommended removal of these riparian berms. However, some riparian and herbaceous vegetation is important for providing cover and contributing to quality fish habitat by providing roughness, shade, and hydraulic complexity.

The downstream berm removal element, R-5, occupies the upper half of an island element that would separate a low flow channel (IC-12) from the mainstem. Berm removal here would create an expansion zone and allow a portion of the island to evolve in response to high flows. The lower half of this island was not proposed for berm and vegetation removal to protect the existing resource.

Skeletal Bar Placement (IC-14)
A number of locations were identified (e.g., C-3) where boulders, cobble, and large rock material could be obtained from onsite excavation and added to in-channel areas to enhance other design elements; the IC-14 element would be constructed as part of Phase A. This skeletal bar would create channel complexity, divert/maintain the thalweg along the left bank, and would provide some hydraulic control near side channels. The skeletal bar would be a "teardrop" shape, with a small alcove on the downstream end and a low area inboard to provide drainage and potential habitat for amphibians. Rock materials (approximately 6"-12" diameter) would be placed into the active channel to construct this feature.

Hydraulic Structures (IC-13)
Hydraulic structures would be constructed of large wood and large rocks. This element would serve multiple complementary purposes: create local hydraulic complexity, initiate scour holes, help provide hydraulic control and compensate for the expansion scour at the entrances to side channels, and contribute to reach-scale hydraulic roughness and gravel retention. In concept, this element would be a gravity structure and include a combination of large wood and large rocks harvested from within the Lower Steiner Flat reach or imported to the area.

Access Roads (C-6, C-7, C-8, C-10, C-11, and C-12) and Contractor Use Areas (C-3 and C-9)
Construction access roads and contractor use areas were located with the intent to minimize disturbance to existing resources as much as possible. There are six construction access roads and two contractor use areas (C-3 and C-9) located on river right. Construction of the IC-13 hydraulic structure would require in-channel work by multiple pieces of equipment. Access would be via the construction road network and contractor use areas. The BLM, land manger at Lower Steiner Flat, has directed that road access to the C-3 area would be decommissioned post-project. Post project, roads in the C-3 area would be blocked and the area revegetated. To the extent possible during construction while maintaining safety requirements, the contractor would allow periodic daily

access to the boat launch at C-6. For safety reasons, the campground at Lower Steiner Flat would be closed during construction.

Upland Spoil Areas (U-2 and U-3)
Spoil areas were located to stay above the Maximum Fishery Flow (MFF) and the Federal Emergency Management Agency (FEMA) 100-year floodplain boundary. To the extent possible, existing trees would be retained and the spoil area footprint would be minimized. Spoil area U-2 would have no net change in volume during phase A. Spoil area U-3 would have a volume of approximately 13,648 cubic yards (368,496 cubic feet) over a 100,660-square foot area, for an average depth of approximately 3.7 feet. Excavated materials would be delivered to these locations from adjacent activity areas.

<u>Phase B</u>

Skeletal Bar (IC-2, IC-4, and IC-8)
Three places were identified where boulders, cobble, and large rock material could be obtained from onsite excavation and added to in-channel areas to enhance other design elements in Phase B. These skeletal bars would create channel complexity, divert/maintain the thalweg along the left bank, and would provide some hydraulic control near side channels. The skeletal bars would be "teardrop" shaped, with small alcoves on the downstream ends and low inboard areas to provide drainage and potential habitat for amphibians. Rock materials (approximately 6"-12" diameter) would be placed into the active channel to construct these features.

Hydraulic Structures (IC-1, IC-3, IC-5, and IC-7)
The Proposed Project includes four hydraulic structures in Phase B that would be constructed of large wood and large rocks harvested from within the project site boundary or imported. These elements would serve multiple complementary purposes: create local hydraulic complexity, initiate scour holes, help provide hydraulic control and compensate for the expansion scour at the entrances to side channels, and contribute to reach-scale hydraulic roughness and gravel retention. IC-5 would help catch logs recruited when element R-3 (described below) is implemented just upstream. In concept, the elements would be gravity structures and include a combination of large wood and large rocks harvested from within the Lower Steiner Flat reach or imported to the site.

Low-Flow Side Channel (IC-6)
The IC-6 low-flow side channel, proposed for Phase B, would be separated from the main channel. The low flow side channel would be occupied by water at low flow. This action would increase the quality, quantity, and frequency of available rearing habitat.

Berm and Vegetation Removal (R-1, R-2, R-4) *(Banks and Floodplains in Figure 5)*
Elements R-1 and R-2 are proposed in the upper portion of the reach. The purpose of terrace lowering in these two upstream locations is to allow new surfaces to flood and create expansions and contractions during high flow. These elements are complemented with constructed point bars and hydraulic structures. The downstream berm removal design element (R-4) is associated with a low flow side channel. R-4 is a partial berm removal on the upper half of the island and is intended to allow a partial medial bar to evolve and flood. The lower portion of the island would not be disturbed.

Banks and Floodplain (R-3) (*Overhanging Alder Cover)*
Mature alders hang over the channel (often over undercut banks), and provide some cover in this relatively straight, narrow, homogenous stretch with several deep runs. The Proposed Project would pull some of these mature alders on river right down and into the channel to increase cover and complexity. The alders would remain with roots still in the bank and, in time, may become entrenched near where they are pulled in, and small accumulations of logs could form in this reach. Some would likely be transported downstream, where they could be trapped in other elements of the proposed design including the downstream IC-5 hydraulic structure. The specific trees to be pulled in would be determined in the field based on direction from Reclamation's field engineer.

Access Roads (C-5, C-6, and C-7) and Contractor Use Areas (C-2, C-3, C-4, and C-13)
Construction access roads and contractor use areas were located with the intent to minimize disturbance to existing resources as much as possible. There are three construction access roads and four contractor use areas proposed for use in Phase B. Construction of the proposed hydraulic structures would require in-channel work by multiple pieces of equipment. Access should be possible via the construction road network and contractor use areas. Roads in the C-3 area would be decommissioned post-project. These C-3 roads would be blocked and the area revegetated. Vehicular access to the river would be maintained at C-6. Tree thinning to emulate historic conditions with larger and fewer trees may be conducted in these areas appropriate. Harvested trees would be used in hydraulic structure implementation or otherwise on site to increase soil moisture and to increase productivity. Trees on low angle slopes adjacent to contractor use areas may also be selectively thinned to enhance wildlife habitat conditions and to reduce potential fuels loading.

Upland Spoil Areas (U-1 and U-2)
Spoil areas were located to stay above the MFF and FEMA 100-year floodplain boundary and protect existing trees and minimize the spoil area footprints as much as possible. These two areas would be used during Phase B.

Temporary River Crossing (X-1, X-2, and X-3)
Two low water crossings (X-1 and X-2), are required to construct the project. A high temporary bridge crossing (X-3) would be the access route for delivery of all spoil material from the river left elements to the upstream right bank spoil area (U-2). All crossings would allow boat passage throughout the project.

Upper Junction City Rehabilitation Site:

Low Flow Side Channel Complex (R-5)
This element consists of a baseflow side channel that splits off from R-4 and ends in the R-6 alcove. The side channel would incorporate topographic and shoreline complexity, large woody debris, and riparian vegetation. The R-5 side channel would provide immediate fry rearing habitat. In addition, it would serve as a flow conduit to connect the W-1 wetland with the mainstem channel at moderate and high flows, and as a water source to aid in establishing riparian vegetation in the R-8 floodplain. Habitat quality in the R-5 side channel and in the R-8 floodplain area is likely to improve over time as riparian cover develops.

Split Flow (R-4) and Constructed Island Complex (IC-1)
These elements are components of a baseflow split-flow area (R-4) around a mid-channel bar. The IC-1 island complex is designed as a geomorphic feature to constrict the mainstem channel and bifurcate flow into the new R-4 channel, creating a split flow condition. The island is designed with a large wood structure at the front end to create a structural hard point that would steer flows and maintain the split flow channel. The downstream end of the island would taper downward in elevation and be constructed with a matrix of fill material to provide hydraulic structure and an effective growing medium for riparian vegetation establishment. These elements would provide additional shallow water, eddies, and shoreline with cover at baseflow. At increased discharges, more of the vegetated bar surface would become inundated and additional rearing habitat created.

Alcove (R-6)
This element is an alcove located at the downstream end of the R-5 side channel. The alcove would provide slow water habitat over a wide range of discharges. It is expected that flow through the R-5 side channel would maintain this alcove for a long period of time.

Floodplain Bench and Bank Recontouring (R-7 and R-8) *(Banks and Floodplains in Figure 6)*
This element is an excavated floodplain bench adjacent to the R-4 split flow and R-5 side channel. These benches provide an area for riparian planting, and a refuge for aquatic species at higher flow levels. Habitat quality in R-4 split flow and R-5 side channel is likely to improve over time as riparian cover develops.

Bank Recontouring (R-9) *(Banks and Floodplains in Figure 6)*
This feature is part of the R-11 side channel complex and is composed of side slope banks for low flow side channel R-9. This area is designed to support large wood placements for habitat development and geomorphic complexity. The bank recontouring would also be revegetated to build diversity and be utilized as habitat for juvenile salmonid rearing.

Floodplain Recontouring and Planting/Enhancement (R-10) *(Banks and Floodplains in Figure 6)*
Earth work in this area would be limited to excavation of several shallow swales oriented diagonally to the mainstem flow direction and parallel to the presumed direction of flow across the right overbank area during floods. The R-10 activity area would be planted with clumps or poles of willow, cottonwoods, or other riparian species. The R-10 riparian area would improve riparian habitat for terrestrial species and provide improved aquatic habitat during high flow periods. The R-10 swales would serve as relatively moist, low-elevation surfaces for riparian establishment and represent topographic diversity that would contribute to overall ecosystem diversity. The swales would be oriented to drain to the river in order to avoid stranding of fish on the falling limb of floods. The habitat quality in this riparian area is likely to improve over time as riparian cover develops.

Large Wood Hydraulic Structure (IC-3)
This element is a large wood structure located at the inlet to the R-11 side channel that would provide additional cover habitat. The IC-3 wood structure is intended to accelerate flow into the inlet to the R-11 side channel, thereby discouraging sediment deposition in the inlet area. This structure is expected to remain intact and continue to function for 10 or more years.

Skeletal Bar Complex (IC-4)
This feature would provide aquatic habitat along the left bank while pushing flows and causing scour along the right bank in the IC-5 forced meander. The skeletal bar complex would consist of a constructed floodplain/bar with an engineered wood structure at its upstream end. The area near the wood structure and along the existing left bank of the river would be approximately at or slightly higher than the elevation of the water surface at the design flow of 7,500 ft^3/s. The constructed surface would be composed of a mixture of immobile boulders, cobble, and fines, and would be planted with riparian vegetation.

Forced Meander (IC-5)
The IC-5 forced meander is designed to work in concert with the IC-4 skeletal bar complex to create an additional meander in the channel's primary flow region (the thalweg). The IC-5 area would be excavated to the elevation of the existing stream bed. The feature is expected to increase river sinuosity, hydraulic complexity, and habitat diversity.

Large Wood Hydraulic Structure (R-14)
This design element would split flow at higher discharge and maintain hydraulic conveyance in the R-4 split flow channel. This element would also help reduce energy loss on the existing river left floodplain surface while steering flow back to the mainstem and helping to maintain adult salmonid holding water.

Low Flow Side Channel Complex (R-11)
This element would consist of a baseflow side channel that incorporates topographic and shoreline complexity, large woody debris, and riparian vegetation. The R-11 side channel would provide immediate fry rearing habitat. In addition, it would serve as a flow conduit to connect the W-4, W-5, and W-6 wetlands with the mainstem channel at moderate and high flows. It is anticipated that habitat quality in the R-11 side channel would improve over time as additional riparian cover develops.

Surface Water Inlet (R-12)
This part of the R-5 side channel complex would allow groundwater infiltration into the side channel. This element would consist of excavating the existing floodplain material and replacing it with a matrix of coarse-gravels to create a permeable lens for subsurface infiltration from the R-4 split flow into the R-5 side channel during baseflow periods. At higher flows, of around 2,500 cfs, the water would over top this infiltration gallery and allow a controlled overflow through a notch like weir system. It is expected that the R-12 inlet would allow about six percent of the total flow into the side channel at river discharges of greater than 7,500 cfs. The R-12 feature would limit water conveyance at higher river stages in order to maintain low velocities in the side channel, which are preferred by juvenile salmonids, and to maintain stream power in the main channel where it is needed to maintain adult holding habitat.

Revegetation Area (R-13 and R-15)
These two floodplain areas would be planted with riparian and upland plantings. No excavation would occur as part of these revegetation design features.

Water Infiltration Area (R-16)
The R-16 area would be excavated and backfilled with permeable coarse sediment to create a region where water from the main channel would infiltrate into the subsurface. The infiltration area

would convey subsurface flow into the W-1 pond and the R-5/R-6/R-8 side channel complex in order to maintain water quality in the pond and side channel during baseflow periods when no surface flow would enter.

Rearing Ponds (W-1, W-4, W-5, and W-6)
A total of four wetland elements would be associated with the R-5 and R-11 low flow side channels. Semi-perpendicular inlet/outlet areas are included in the design to divert and shear water from the side channel at base flow discharges into the pond for rearing habitat development. The rearing ponds would be approximately 4-6 feet deep and would have slow water habitat features including existing and developed riparian vegetation, large wood, slash, and whole trees. The ponds would provide slow backwater refugia and year round rearing habitat for juvenile salmonid species. Groundwater infiltration and surface water in-flow from the associated side channels would supply the ponds with a cold water environment. Existing tree/shrub canopy would be saved during construction to provide food sources, shade, and protection from predation. The ponds would contain deeper pools that have a connection to groundwater to supply needed cold water. Existing vegetative cover and re-vegetation planting would be incorporated into the ponds to enhance their productivity for rearing fish.

Construction Access Roads (C-1 through C-9, C-14, C-16, and C-17)
Construction access roads are classified as new permanent, existing, or temporary. Access roads are classified based on the public or private landowners' goals and objectives for their property. Within the project site, existing access roads would predominantly be utilized. Because scrapers would likely be utilized for excavation of channels and floodplains, these continuous loop haul roads would be essential for safety and efficiency. Post-project, access roads would be returned to pre-construction condition, decommissioned, or left as improved, according to landowner approval.

Contractor Use Areas (C-10 through C-12 and U-2)
Contractor use areas would be used for construction access, staging, stockpiling, mobilization, gravel processing, and other necessary construction activities during implementation. These areas are designated for support areas only and no excavation or fill would take place within these zones. The U-2 contractor use area is the only contractor use area designated in an upland, not riverine, area; consequently it is designated as a "U" contractor use area. Minor clearing, grading, shaping, or decommissioning may take place but would need to be approved by the project construction manager. Depending on landowner goals and objectives, each contractor use area may be improved back to pre-construction condition or decommissioned.

Upland Spoil Areas (U-1 and U-3 [in the Lower Junction City site boundary])
Upland spoil areas would be used for placement of excavated fill materials. Use of these upland areas away from the Trinity River riparian zone for placement of fill materials would not affect the 100 year floodplain inundation levels. Upon project completion these areas would be heavily seeded and mulched and would evolve into upland terraces. One upland spoil area (U-3) is located in the Lower Junction City Rehabilitation Site boundary and would be used as the primary spoiling area for all river right excavation. The U-3 area was proposed to minimize material hauling costs that would be required if river right excavated materials were to be hauled to river left upland areas. Movement of materials to river left would require double handling of excavated material as off-road dump trucks from the floodplain would need to transfer spoils to "road-worthy" vehicles

for transport across the Dutch Creek Road Bridge. Additional traffic control and potential road maintenance costs could also be incurred during transfer to river left spoil areas. Impacts to trees and habitat would be minimized in upland area construction.

2.4.2.3 Common Activities and Construction Criteria and Methods Associated with the Proposed Project

In addition to the activities included in Tables 2 and 3, several other activities are common to all activity areas to varying degrees. These common activities (vegetation removal, watering, and monitoring) are briefly discussed in Appendix A. Appendix A also provides a general overview of the construction process for the Proposed Project. Earthmoving equipment that may be used at the sites to complete the construction activities includes off-road articulated dump trucks, wheel loaders, tracked excavators, dozers, push-pull scrapers, water tenders, and graders. Monitoring would occur as a required element of the Proposed Project and responds to the TRRP program management objectives, as well as the elements of the Mitigation Monitoring and Reporting Program (MMRP) required pursuant to CEQA. The MMRP, included as Appendix E of the Trinity River Master EIR, is incorporated in its entirety by reference. Specific mitigation measures proposed as part of the MMRP for the Proposed Project are included as Appendix A of this EA/IS.

2.4.2.4 Tentative Schedule

Design of the Lower Steiner Flat and Upper Junction City channel rehabilitation sites started in 2010 and the Proposed Project, which incorporates landowner and TRRP design input, was completed in 2011. The majority of the Proposed Project would be constructed in 2012 between July and December, with the majority of the excavation and grading activities occurring between July 1 and November 1. The campground at Lower Steiner Flat would be closed for safety during the construction period. Arrangements with the contractor at the "Chop Tree" boat launch within the upstream work area at Lower Steiner Flat would be made so that, to the extent possible, the ramp would be open early in the morning (before 7 am), and in the evening (after 7 pm). Elements to be constructed in 2012 include all of the proposed activities at the Upper Junction City site and Phase A activities at the Lower Steiner Flat site. Phase B activities proposed at the Lower Steiner Flat site are tentatively planned within the next five years. Most site revegetation, with willow and riparian cuttings, and monitoring would occur in subsequent years. Revegetation of island areas, as well as seeding and mulching of the floodplain and terrace, would be scheduled during and immediately after construction. Construction associated with the Proposed Project cannot begin until the environmental process is completed. In addition, the following must have been completed: the final designs, plans, contract specifications, and cost estimates; award of contract(s) for work; hazardous materials site assessments; acquisition of rights-of-way; acquisition of permits; and design approvals from local, state, and federal agencies.

To minimize impacts to breeding birds, construction would typically begin after nesting (August 1), but could begin sooner if pre-August bird surveys determine that nesting birds would not be impacted by construction. Surface disturbance activities may be limited during the late spring (May and June), depending on the flow release schedule established for the particular water year. Although the majority of excavation and grading activities would typically occur between July 15 and November 1, excavation may continue later so long as surface water runoff does not increase the mainstem Trinity turbidity by >20% (Trinity River summer turbidity is typically very low; <2 nephelometric turbidity units [NTU]). All in-channel work would be completed by September 15.

Revegetation (placement of rooted plants, pole cuttings, or seeding) would take place in the wet season (fall/winter) following work or a year after construction.

2.5 Alternatives Considered but Eliminated from Further Evaluation

In addition to the alternatives described above, the following alternatives were also considered but dismissed for the reasons provided.

2.5.1 Dispose of Material below 100-Year Base Flood Elevation

To minimize material haul distance and cost, placing excavated material below the 100-year base flood elevation (BFE) was considered. This option would involve moving excavated material a short distance and depositing it in an adjacent flat area within the floodplain. After investigation, it was determined that placing large amounts of material in the floodplain could result in undesirable changes to FEMA flood elevations both within and outside of the project boundaries.

2.5.2 Increase Removal of Riparian Vegetation

In addition to influencing the alluvial processes that have been reestablished (to varying degrees) post-ROD, the distribution and density of riparian vegetation adjacent to the Trinity River below the TRD inhibits views of the river from a number of locations, including residences, businesses, and recreational river access points. As the Proposed Project was developed, the lead agencies considered an alternative that would substantially increase removal of riparian vegetation to enhance the aesthetic values for local residents and visitors to the Trinity River. Based on input from agencies and local landowners, the lead agencies considered the request to remove more riparian vegetation, but determined that the level of vegetation removal required to enhance aesthetic values could result in significant adverse environmental impacts and is beyond that required to meet the fundamental objectives of the TRRP.

2.5.3 Additional Work Elements at the Lower Steiner Flat and Upper Junction City Rehabilitation Sites

Additional rehabilitation elements were initially proposed in the individual site TRRP Concept Design Reports. Following the design review process and acquisition of additional geologic data, several of these elements were altered, eliminated, or replaced in the final design. The individual Concept Design Reports include specific details about the other elements and the rationale for why they were dropped from the final design.

2.5.4 Completion of all Work at the Lower Steiner Flat Rehabilitation Site in 2012

The initial design for the Lower Steiner Flat site included all of the elements in one phase, i.e., all elements would have been constructed in 2012. However because of concerns about impacts of the Phase B actions on fish habitat, the project was split into two phases.

page left intentionally blank